

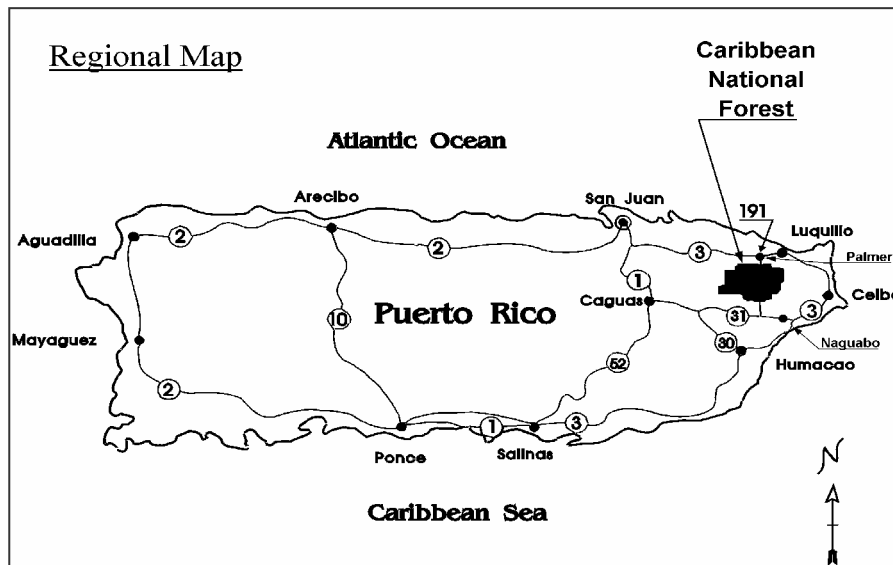
# ***Forest Supervisor's Certification***

I have evaluated the monitoring results and recommendations in this report. I have directed the Forest Planner and Inventory and Monitoring Program Manager to develop an Action Plan to respond the issues, concerns and opportunities that exist in order to evaluate the monitoring effectiveness. I have considered funding requirements in the budget necessary to implement these actions.

The Revised Forest Plan is sufficient to guide forest management for fiscal year 2006, unless ongoing monitoring and evaluation identify further need for change. Any amendments or revisions to the Revised Forest Plan will be made using the appropriate National Environmental Policy Act (NEPA) procedures.

**Pablo Cruz**

Forest Supervisor



# **2004 Monitoring and Evaluation Report Caribbean National Forest**

## **Executive Summary**

Highlights for Fiscal Year 2004 (FY04):

1. Decision Notices for the following:
  - a. Exotic Species
  - b. Aviary Construction
  - c. Forest Plan Amendments
2. Sabana Picnic Area Design.
3. International Institute of Tropical Forestry Congress Centennial participation in August 2004.
4. Landslides and main access routes washouts initial attack, damage assessment, and storm report after September 15, 2004 Tropical Storm Jeanne.
5. Proposed Wilderness legislation.
6. Financial Management Business Process Reengineering and Financial Management Improvement Plan.

## **Introduction**

The Caribbean National Forest (CNF) annually monitors and evaluates its programs and projects to determine progress toward achieving Revised Forest Plan goals, objectives, and standards and guidelines.

The approved Caribbean National Forest Revised Land and Resources Management Plan (Revised Forest Plan) was formally released to the public July 11, 1997. The appeal period extended from July 11 through October 14, 1997. No appeals of the Revised Forest Plan were received. Three Forest Plan Amendments were completed in 2004.

This 2004 report is structured to correspond with the monitoring direction in Chapter 5 of the Revised Forest Plan. Information for each monitoring element includes: desired condition(s); parameters to measure progress toward those conditions; and results of monitoring of these parameters during fiscal year 2004.

Monitoring and evaluation is an ongoing process, documented through annual reviews by the Forest Supervisor and Forest staff. Monitoring indicates whether management

direction in the Revised Forest Plan is being effectively carried out and points out needed modification of that direction. It also shows whether effects of implementing the Forest Plan are occurring as predicted; whether the application of management area prescriptions responds to public issues and management concerns; and the costs of implementing the Forest Plan.

## **Ecosystem Condition, Health and Sustainability**

### **Watershed**

No significant changes to soil and water resources as described in the LRMP EIS occurred. The effects of short rainfall periods characterized by intense showers were experienced during the month of September 2004. Similar effects were experienced in April 2003. On September 15, 2004 Tropical Storm Jeanne passed over the island of Puerto Rico. On September 16 a combined two-day total of 15.84 inches of rain were recorded officially at the USGS Mameyes River-NR Sabana, PR water gauge station. This event combined with saturated terrain caused by prior rains (accumulation of 1.05 inches on September 14, 2004) produced severe flooding in all of the Forest's rivers and multiple landslides on all main access routes.

#### **Measured rainfall by Municipality (Source: USGS, precipitation data)**

<b>Municipality</b>	<b>Forest Watershed</b>	<b>Total Rainfall (Sept 15)</b>	<b>Total Rainfall (Sept 16)</b>
Naguabo	Rio Blanco, Rio Santiago	12.86	3.38
Rio Grande	Rio Mameyes, Rio Espiritu Santo	9.1	1.75
Luquillo	Rio Sabana, Rio Pitahaya	8.16	3.20
Fajardo	Rio Fajardo	9.99	4.87

### **Watershed Condition**

Forest watershed condition was impaired in Rio Mameyes and Rio Blanco Watersheds. The Forest initiated treatment identification for landslides surveyed on September 17, 2004. The most obvious damage on the Forest was debris on roads, trails, and river

riparian areas. Landslides triggered by heavy rains caused 24 acres bare of vegetation. These slide areas continued to shed high amounts of sediments.

The following table summarizes the number of landslides and affected areas as of September 21, 2004.

<i><b>WATERSHED</b></i>	<i><b>Number of Landslides</b></i>	<i><b>Affected Area (Acres)</b></i>
Rio Blanco	2	2
Rio Mameyes	14	14
Rio Espiritu Santo	2	2
Rio Sabana	1	1
Rio Fajardo	1	5
TOTALS	20	24



Landslide at 191 North Km. 7.8, within Rio Mameyes Watershed.

## **Water Quantity**

Quantitative instream flows were not established in FY 04. Flow regimes considered during plan development were not modified. Water resource use remained the same since no intakes were upgraded. No management events in FY 04 altered the amount of

water flowing from the Forest as stated in the plan. No annual stream flow data has been published for CY 03 by USGS.

## **Water Quality**

There was no additional sediment delivery attributable to recreation, road construction or recreation development. During FY 04, constructions the Sabana Recreation Site, Road PR 191 South Improvement, and Jimenez Parrot Aviary were not initiated. Nevertheless, total sediment delivery of 24 acres of bare soil caused by landslides resulted in an estimated sediment delivery of 42 tons per year.

A diesel spill was reported on East Peak Site. The spill occurred from a diesel tank in a truck. The area is located in the watershed divide of Rio Blanco, Queered Río Santiago and Río Fajardo. The type of soil is Dwarf muck, 10 to 65 percent slopes, windswept. Based in CNF Soil Survey, this soil is very deep poorly drained and the permeability is moderately slow. Results of the investigation concluded that no stream water systems were affected.

### ***Is Soil and Water Desired Future Condition met?***

*Desired Condition:* Watershed condition is restored, enhanced, or maintained.

*Measurement:* Water sampling before and after treatments. Sediment levels are measured on control and treated areas. Assessment of vegetative cover.

*Results:* The Forest's watershed condition and water quality, adversely affected by April 2003 Rain Event improve after restoration of landslides. The Canopy Trimming Experiment (CTE) did not altered watershed characteristics. This is due to the relatively small-sized plots and the low-impact protocol in the proposed experiment. The CTE plots are on ridge tops with relatively low slopes (averaging 11-15°). The CTE left 1 leave all vegetation rooted in the ground, and will not alter the vegetation canopy below 3 meters above the ground in any of the plots. Additionally, the soil-surface litter layer was left intact, and in some cases increased (on respective treatment plots). These vegetation and litter layer characteristics provided interception and absorption of rainfall through the duration of the CTE; therefore preventing substantial soil erosion and sedimentation.

*Desired Condition:* Aquatic ecosystems remain healthy, or are restored where stream segments have been dewatered by consumptive use. Water quantity and quality are adequate to support healthy populations of aquatic animals. Stream flows are not reduced below natural minimum flows.

*Measurement:* Stream flow monitored at permanent gauging stations, and above and below water intakes with portable flow meter. Six permanent gauging stations are located on the Forest. They are located on the Sabana, Mameyes, Rio Icacos, and Espiritu Santo Rivers (USGS, 2003).

*Results:* USGS Water Resource Data for Puerto Rico has not been published for the evaluation period. Fisheries surveys conducted show stability of aquatic populations and diversity (Cano, 2003). General observations suggest a wet year; therefore, streamflows were within or above natural minimums.

*Desired Condition:* Rivers provide dynamic links for aquatic life.

*Measurement:* Stream flow and water quality measured at gauging stations, water intakes, recreation sites and project areas. Inventory rivers and riparian areas.

*Desired Condition:* Water use and development is balanced.

*Measurement:* Determine amount and location of water extracted for consumptive use.

*Results:* The estimated amount of water extracted for consumptive use remains the same. The following table shows the estimated withdrawal by watersheds from surface water intakes operating on streams that originate within the CNF and are operated by the Puerto Rico Water and Sewage Authority (PRASA) in 1994:

Within Forest Withdrawal	Estimated Withdrawal (gal/day)
<b>Río Espíritu Santo Watershed</b>	
Quebrada Jiménez	951,120
Quebrada Grande	264,200
Río Espíritu Santo	317,040
Río Grande	2,298,540
<b>Río Grande de Loíza Watershed</b>	
Quebrada Los Santos	660,500
Río Gurabo	1,241,740
<b>Río Sabana Watershed</b>	
Río Sabana	792,600
Río Cristal	792,600
<b>Total within Forest Withdrawal</b>	<b>7,318,340</b>

No additional special use permits for intake facilities were received.

***Are projects complying with design, LRMP and NEPA?***

Project compliance with design, LRMP, and NEPA can be evaluated in the Sabana Recreation Area EIS. Technical participation of the Ecosystem Management Team Leader and Forest Hydrology Trainee occurred during development of the Final EIS for Río Sabana Picnic Area Construction, Río Sabana Trail Reconstruction and Highway PR 191 Reconstruction, Km 21.3 to 20.0. A major factor that affects water quality of the Río Blanco watershed is sedimentation. Landslides that severed PR 191 up road from the proposed project area in the 1970s, still contribute to the sediment loading of the river.

Activities such as recreation site, road and trail construction can potentially provide additional sources of sediment import.

“Best Management Practices” as defined in the Standards and Guidelines for the Revised Forest Plan, were added as mitigation measures to reduce the potential for increased sedimentation and help stabilize current sources (Sabana Recreation Area FEIS, 2003). Practices were incorporated in to design and contract. The project is scheduled for implementation on fall of 2004. Project monitoring activities will include evaluation on the implementation and effectiveness of the FEIS mitigations during and after construction starting in the summer of 2004.

***Are soil and water resources goals and objectives met?***

*Forest Plan Goal:* Cooperate with research scientist to develop best management practices for watershed protection.

*Results:* Support to the research community was provided to the Long Term Ecological Research Station at El Verde (LTER) Canopy Trimming/Hurricane Simulation Experiment Environmental Analysis.

*Forest Plan Goal:* Emphasize watershed improvement activities in areas of highly erosive soils and areas of concentrated recreation use.

*Results:* Watershed improvement needs activities were focused on these areas through TS Jeanne Recovery Project.

The overall conclusion is that the Forest continues to manage water resources as an emphasis items. Water remained an issue for FY 04 period. Forest water resource management activities need to concentrate efforts in quantification of resource data, development of quantitative instream flows, and completion of a water quality plan.

***Are we following Standards & Guidelines?***

Use of Standard and Guides can be evaluated in Canopy Trimming Experiment conducted by the University of Puerto Rico. The Caribbean National Forest Revised Land and Resource Management Plan (LRMP) places this proposed project within a Research Management Area and Integrated Management Area. Some of the LRMP goals and standards required to the project were:

1. Require contractors to prepare and implement an erosion and sediment control plan.
2. Place silt fences, hay bales or other sediment entrapment devices around potential sediment sources if these actions are necessary.
3. Require preparation of hazardous materials prevention and cleanup plan.

4. Conduct weekly inspections of Quebrada Sonadora and Quebrada Grande. Visually inspect turbidity.
5. Limit clearing of vegetation to the minimum required for the project.
6. Require preparation of a plan for prevention and cleanup of spills of petroleum products (for electroshocking equipment).
7. Use only native vegetation for rehabilitation or stabilization if these actions are necessary.

The Canopy Trimming Project represents an example of compliance with standard and guidelines.

## **Primary Forest**

*Desired Condition:* Primary forest in all four-forest types is protected. Acreage of primary forest is not reduced.

*Measurement:* Visual inspection of primary forest to determine acres altered by trail construction or other development.

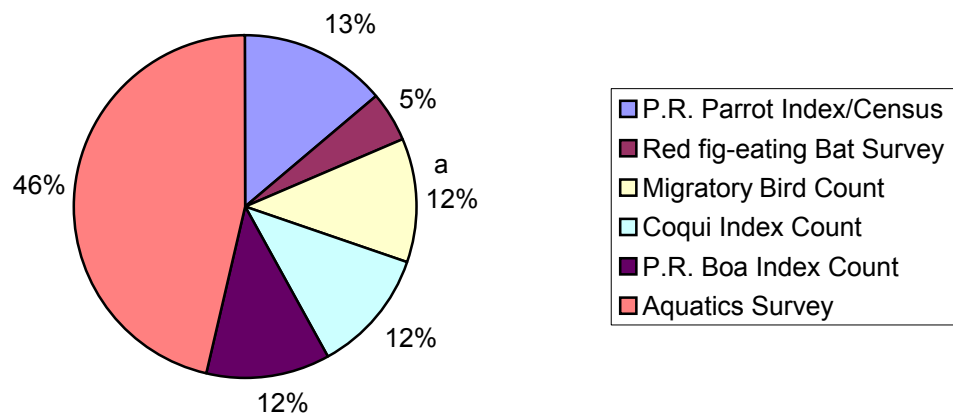
*Results:* No trail construction occurred in primary forest during 2004.

## **Wildlife and Fish**

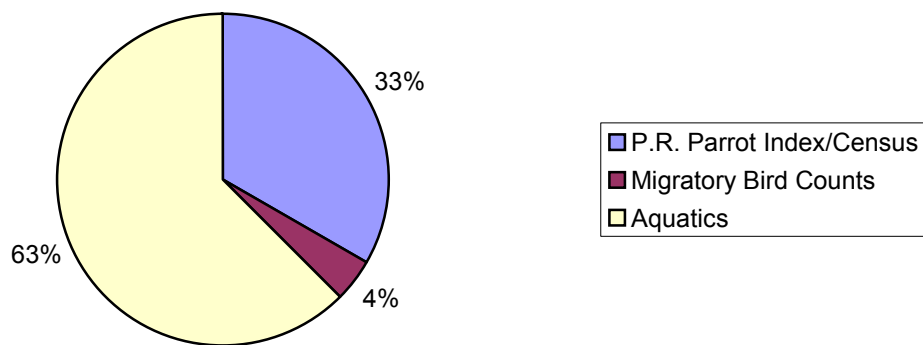
Since the adoption of the National Forest Management Act the management indicator species concept has been review and critiqued by the scientific community (Caro and O'doherty 1999). Management indicator species (MIS) are species selected because their population changes are believed to indicate the effects of management activities (36 CFR219 (a) (1)).

The following section has information on long-term monitoring of the Puerto Rican Parrot (*Amazona vittata*), forest bird counts, Red fig-eating bat (*Sternodurnum rufus*), Coqui counts, Puerto Rican Boa (*Epicrates inornatus*) , and fisheries surveys on the Caribbean National Forest.

**Days designated to each survey FY03 out of total of 43 monitoring days**



**Days designated to each survey FY04  
24 days**



**Desired Condition:** The Puerto Rican Parrot Population remains stable or increases

**Measurement:** 1) Successful nesting attempts indices of the wild population.  
2) Sustain the number of active breeding parrot nests.

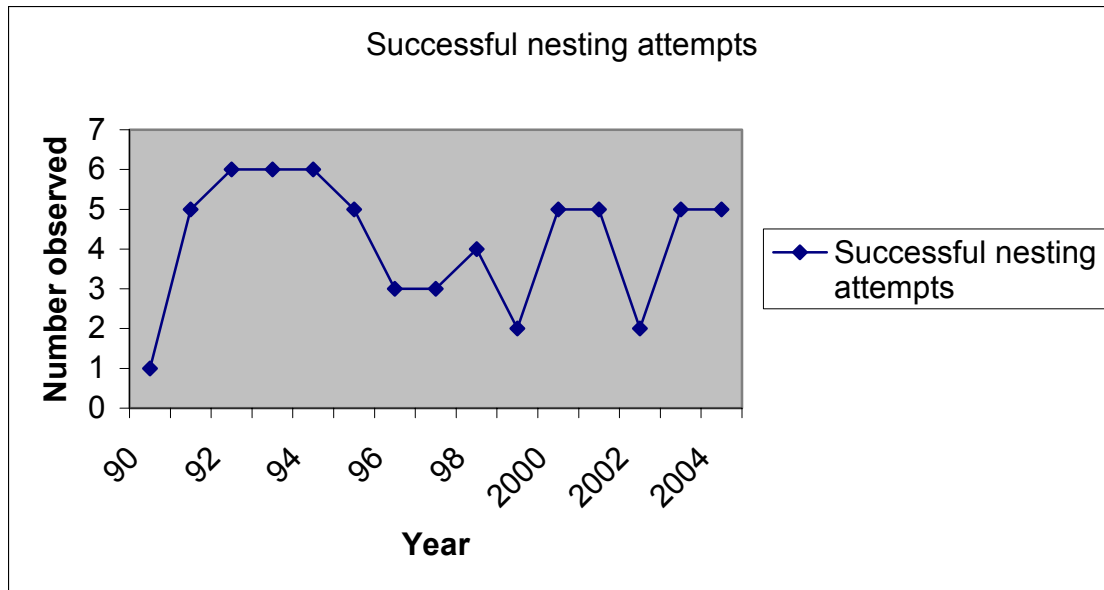
Results: A coordinated U.S. Fish and Wildlife Services index on the Caribbean National Forest involving two other agencies to conduct population estimates and provide protection for the last wild flock.

CNF personnel constructed two new artificial/natural cavities and improved seven nests for the recovery effort. The CNF also constructed 1 new lookout platform to support the continuing index process. Access to the parrot nesting area and points of interests is a concern that the CNF met, improving approximately 3 miles of existing trail with long-lasting results.

The third release of Puerto Rican Parrots occurred in May 2003 to add to the number of wild parrots in the Forest. Plans to establish a second population of parrots in the wild is still in the planning process between the U.S. Forest Service, U.S. Fish and Wildlife Service and the Puerto Rico Department of Natural Resources.

Summary of Puerto Rican Parrot Recovery From 1990 to 2004												
Year	90	91	92	93	94	95	96	97	98	99	00	01
Successful Nesting Attempts	1	5	6	6	6	5	3	3	4	2	5	5
Total Young Produced in the Wild	2	8	10	13	13	14	7	7	10	3	13	14
Young Fledged into the Wild	2	7	11	15	14	15	8	7	9	3	7	5
Population Estimate (post breeding)	25	32	35	41	42	44	45	34	36	40	48	40

Year	02	03	04
Successful Nesting Attempts	2	5	5
Total Young Produced in the Wild	2	5	7
Young Fledged into the Wild	1	4	7
Population Estimate (Post breeding)	30	17	32



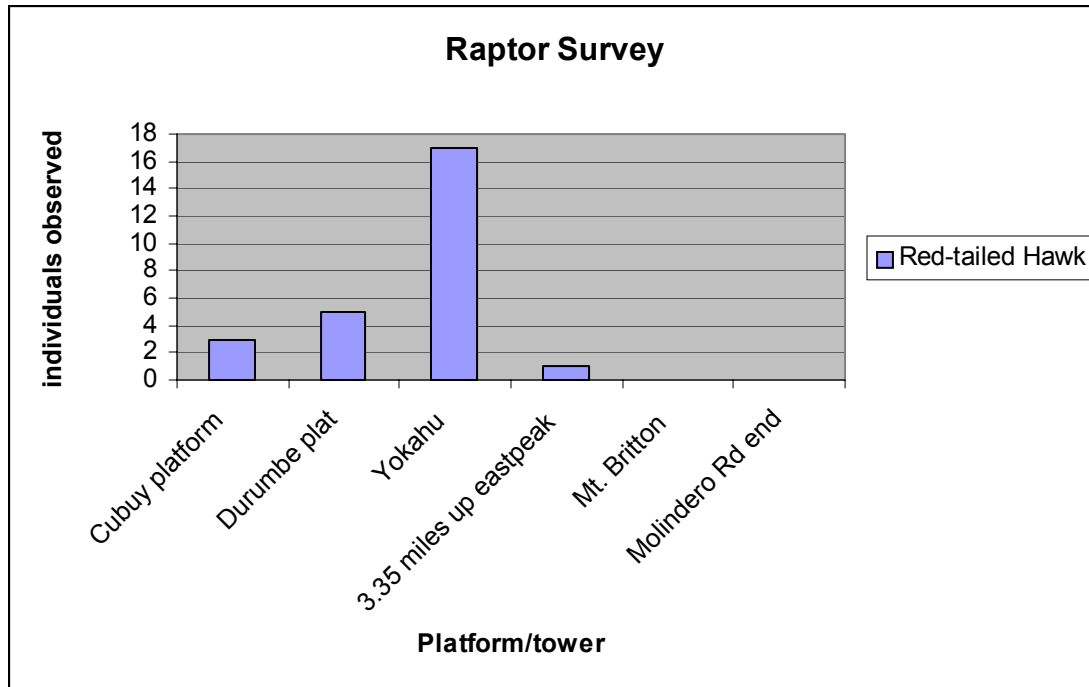
Discussion: Although the PRP has improved since Hurricane Hugo there seems to be a limited carry capacity for the parrots in the present nesting area. There is an ample number of artificial nests available with improving knowledge over the birds preference. The bird itself may be displaying irregular population trends and many different factors can be attested to this pattern. The CNF had great results in reconstructing the trail and platform system. There is hope that the second wild population will be able to prosper in a much more hospitable climate than the Forest, but that will require time to see if it becomes a success.

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**Desired Condition:** Sharp-shinned and Broad-winged hawk populations are increasing.

**Methodology:** Point Counts. In coordination with a Red-tailed hawk index the CNF, conducted in FY 02, to document any occurrences of the two endangered hawks subspecies.

**Results:** No Sharp-shinned or Broad-winged hawks were observed in either of the indices. In FY 04 no specific raptor survey was conducted.



Discussion: Most of the raptors are included in the breeding bird survey or Christmas counts. No count was conducted in this species-specific outline. The Red-tailed hawk shows its clear domination as the top avian predator on the Forest and will continue its supremacy into the future. The endangered species raptors were simply not observed, but that is not stating they are not there. In other counts they have been documented.

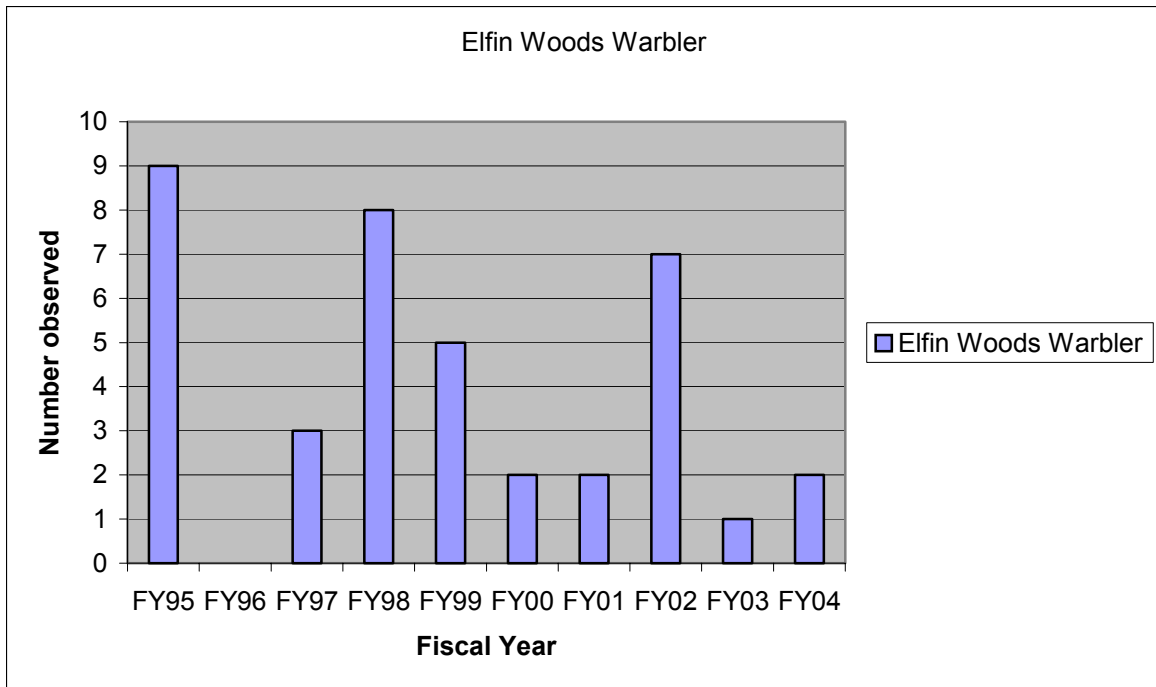
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**Desired Condition:** Elfin woods warbler populations are stable or increasing.

Measurement: Breeding bird point counts

Results: The Christmas Bird Count for Caribbean National Forest covers some of the warbler's habitat on the Forest. Numbers of elfin woods warblers on these Christmas counts for the past nine years:

Year	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
Elfin Woods Warbler	9	0	3	8	5	2	2	7	1	2



Discussion: Elfin Woods Warbler is obvious dipping. Until a scientific study comes out with a conservation assessment of the species there will be precise estimate of the species on the island.

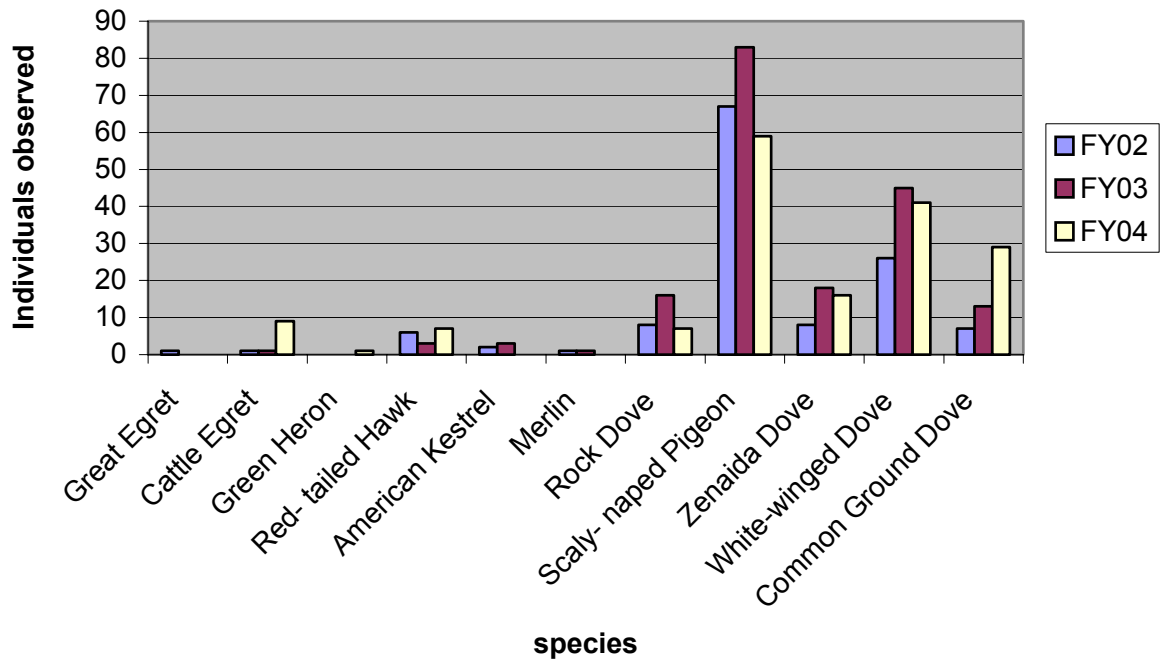
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**Desired Condition:** Populations of the Forest's birds are stable or increasing.

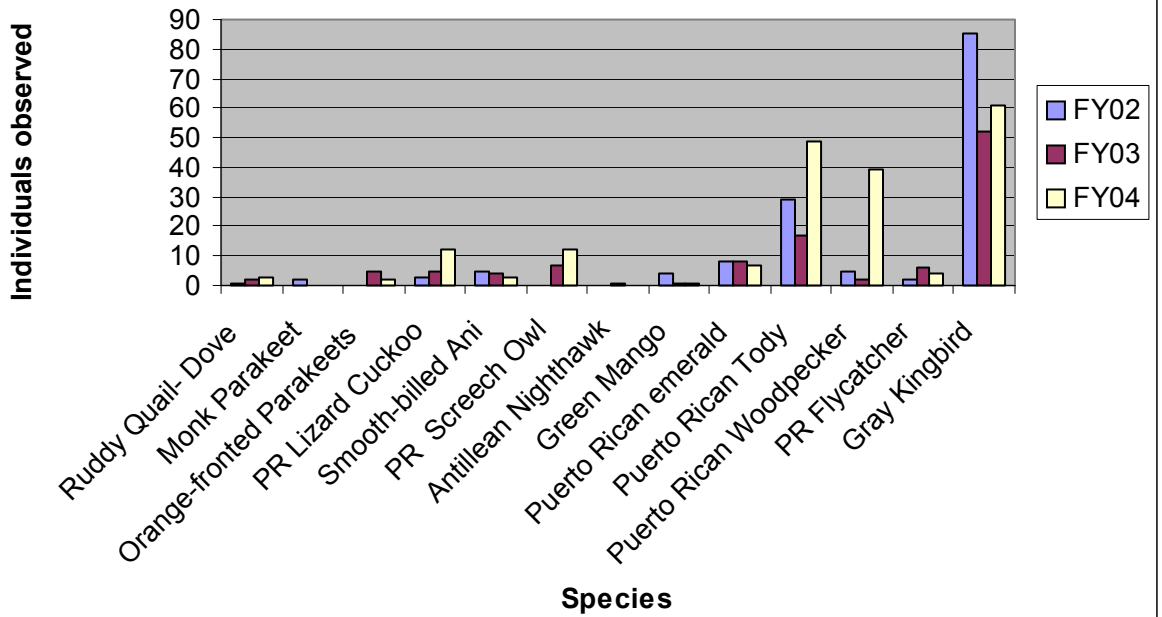
Measurements: FY02 Christmas Transect counts

Results: A five-part graph displaying species found on the forest and just outside of the forest boundary (Colinas del Yunque).

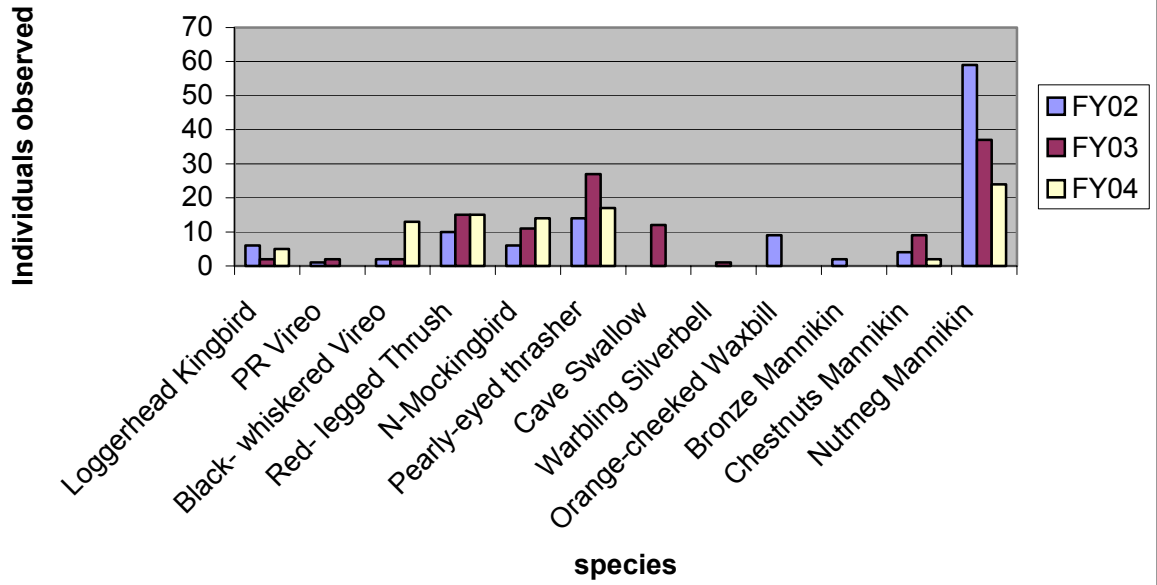
**Christmas bird count part I**



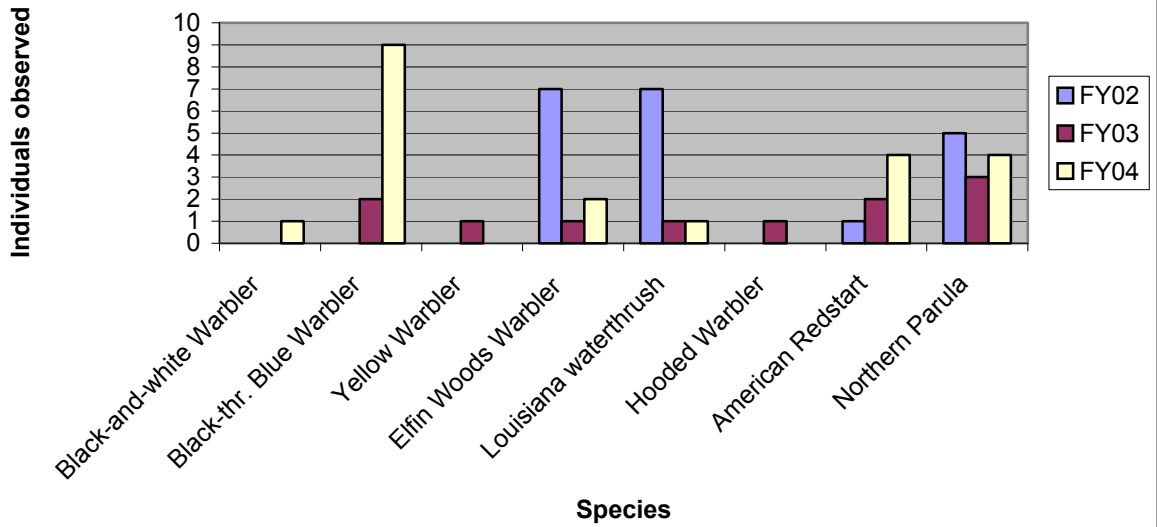
**Christmas bird count part II**



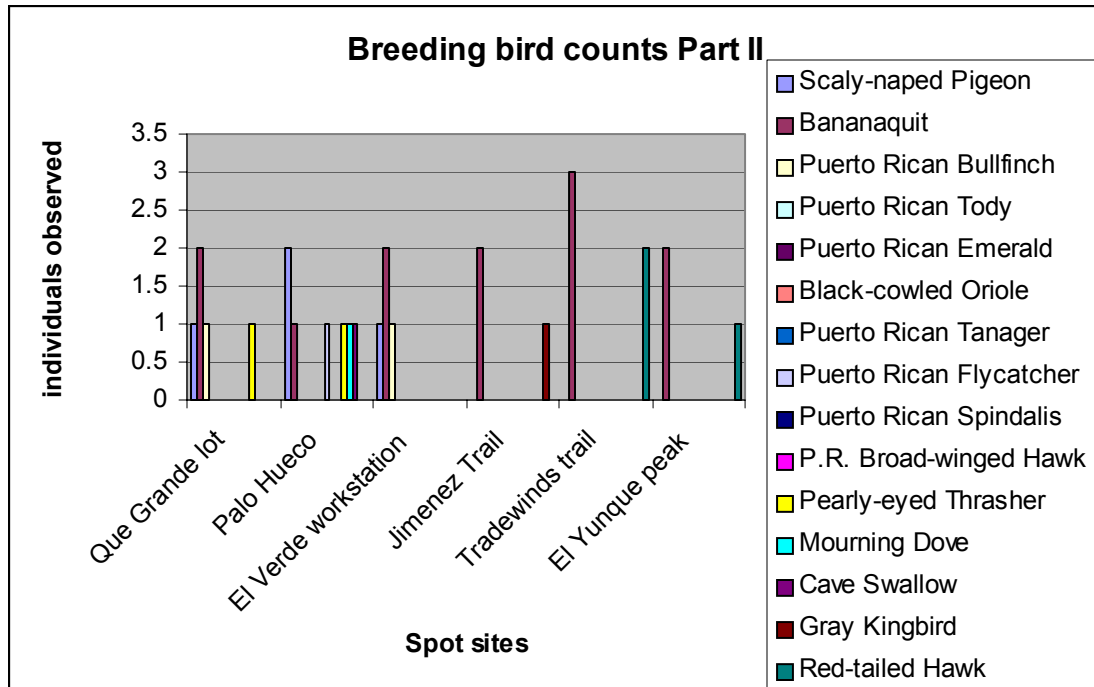
### Christmas bird count part III



### Christmas bird count part IV



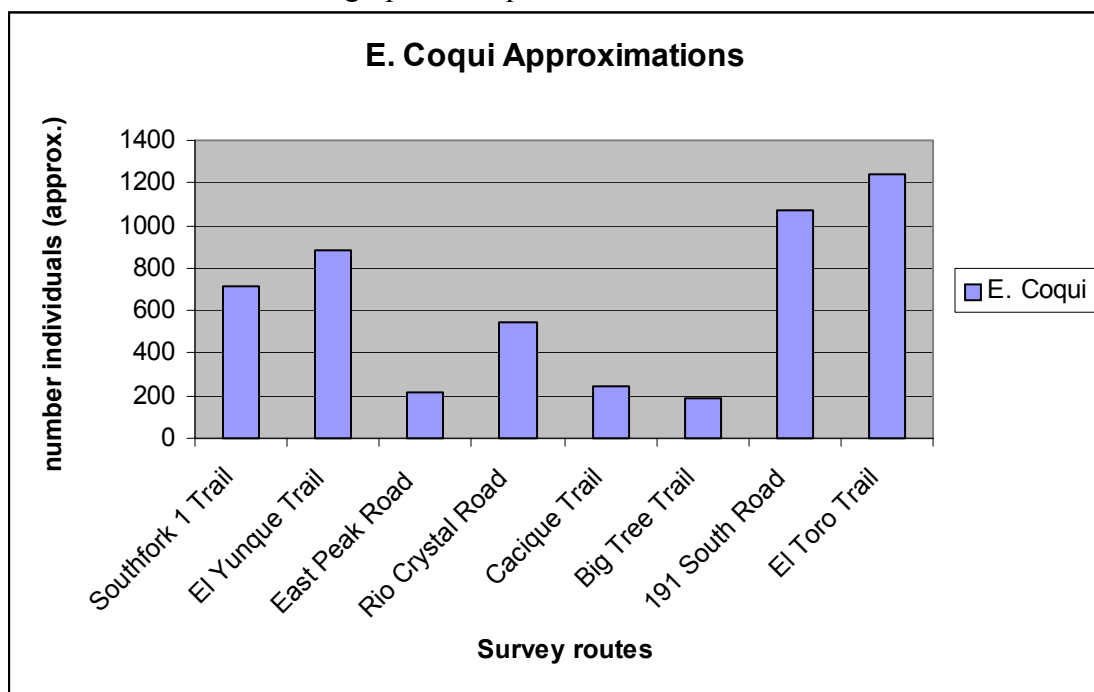


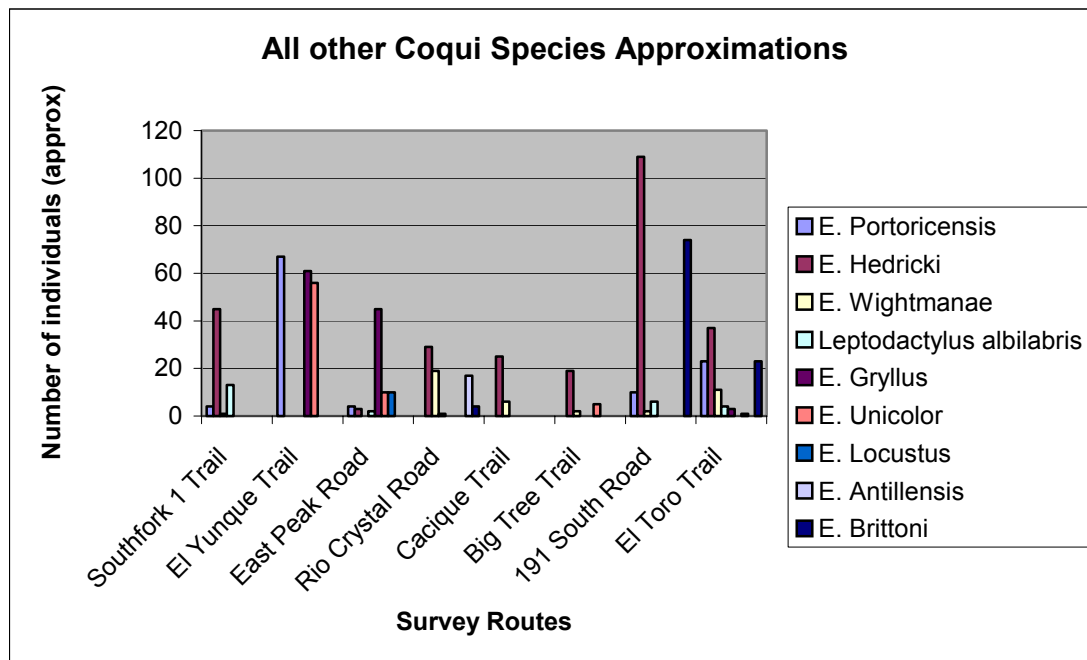


**Desired Condition:** Coqui populations are stable or increasing.

**Measurement:** Predetermined Transects with multiple spot points.

**Results:** Fiscal Year 2003 graph of Coqui observations on the Forest





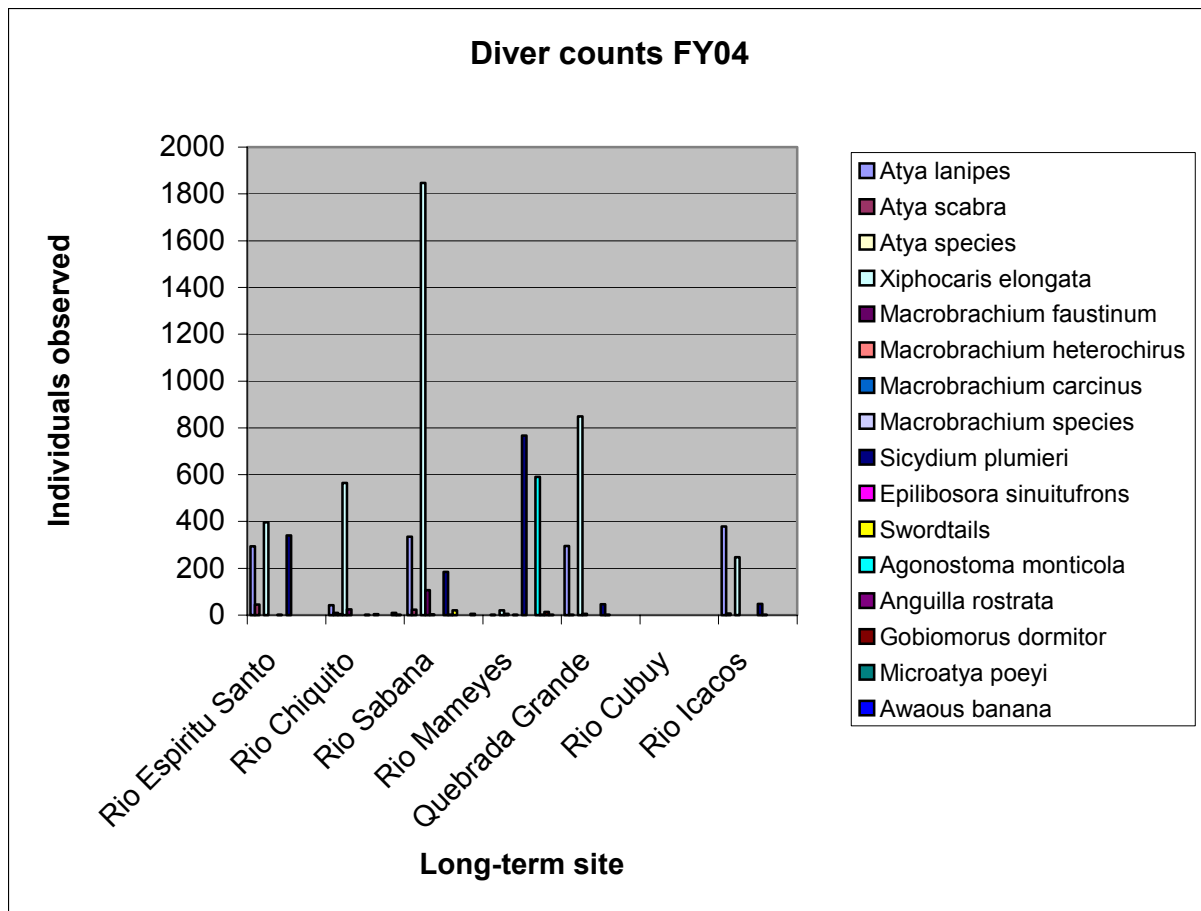
**Desired Condition:** Sustain a healthy and robust aquatic ecosystem on the Forest. Monitoring any potential barriers to migration of fish or crustaceans.

**Measurement:** Electro-fishing and snorkel stream surveys developed by the Center of Aquatic Technology Transfer to establish data for aquatic species and habitats. Annual monitoring of selected stream reaches.

**Results:** The CNF accomplished a total of 10 miles of streams surveys. Stream surveys focus on habitat availability, while electrofishing centered on species occurrences.

The following are diver count graphs in the long-term sites on the Forest.





Desired Condition: Populations of the Endangered Puerto Rican Boas are stable or increasing.

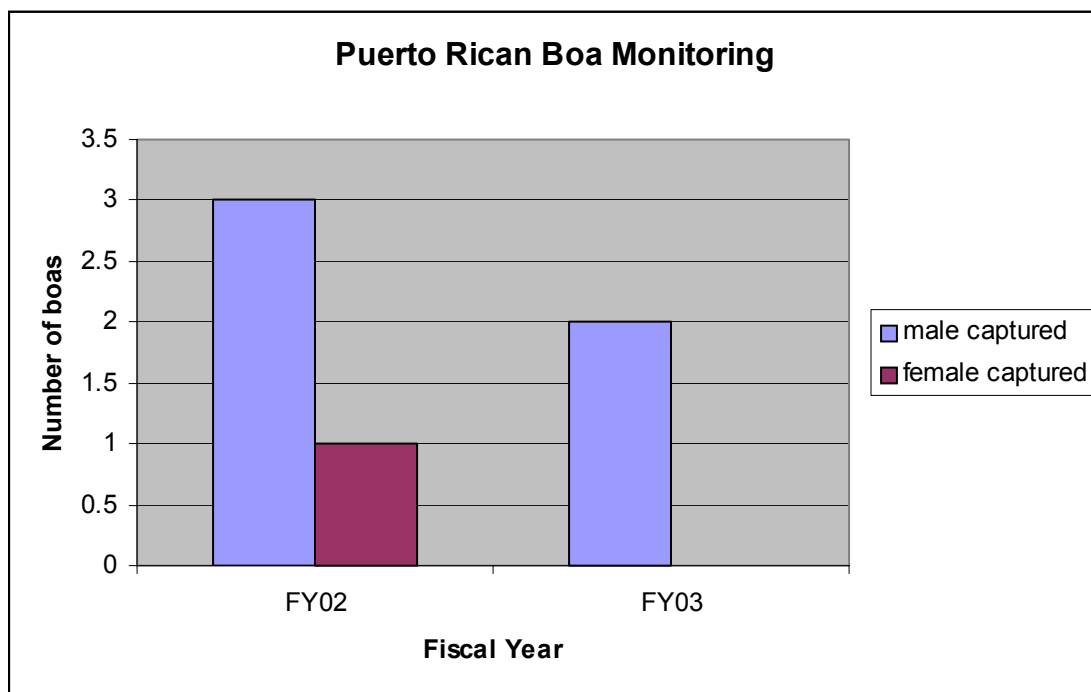
Measurement: Delineated Road night surveys.

Results: The survey is derived by the same survey method used in Dr. Joseph Wunderle's initial study into the biology of the endangered boa on the island.

	<i>Total Length (cm)</i>	<i>S-vent length (cm)</i>	<i>Weight (g)</i>	<i>Capture Place</i>
1	118	108	515	Close to bridge 191
2	192	183	124	Close to sign on 988
3	170	146	1502	Next to Fence on 988
4	54	44	30	R. 192 platform house

	<b>Capture date</b>	<b>Capture time (pm)</b>	<b>Pit Tag Number</b>	<b>Sex</b>	<b>Additional notes</b>
1	4/29/2002	8:23	36096859	M	30.6 mileage (New tag)
2	5/7/2002	9:21	36098515	M	New tag
3	5/8/2002	10:00	36026595	M	New tag
4	5/10/2002	7:48	///////	F	Newly born

	Capture date	Capture time	Pit Tag Number	Sex	Additional notes
1	5/14/2003	8:17pm	///////	M	Specimen escaped at night
2	5/15/2003	9:40pm	035809783	M	New tag



Bat surveys by Dr. Michael Gannon of the Pennsylvania State University funded by U.S. Fish and wildlife conducted on the Forest in FY 03.

Results: A graph showing the trends of bats on the Forest.

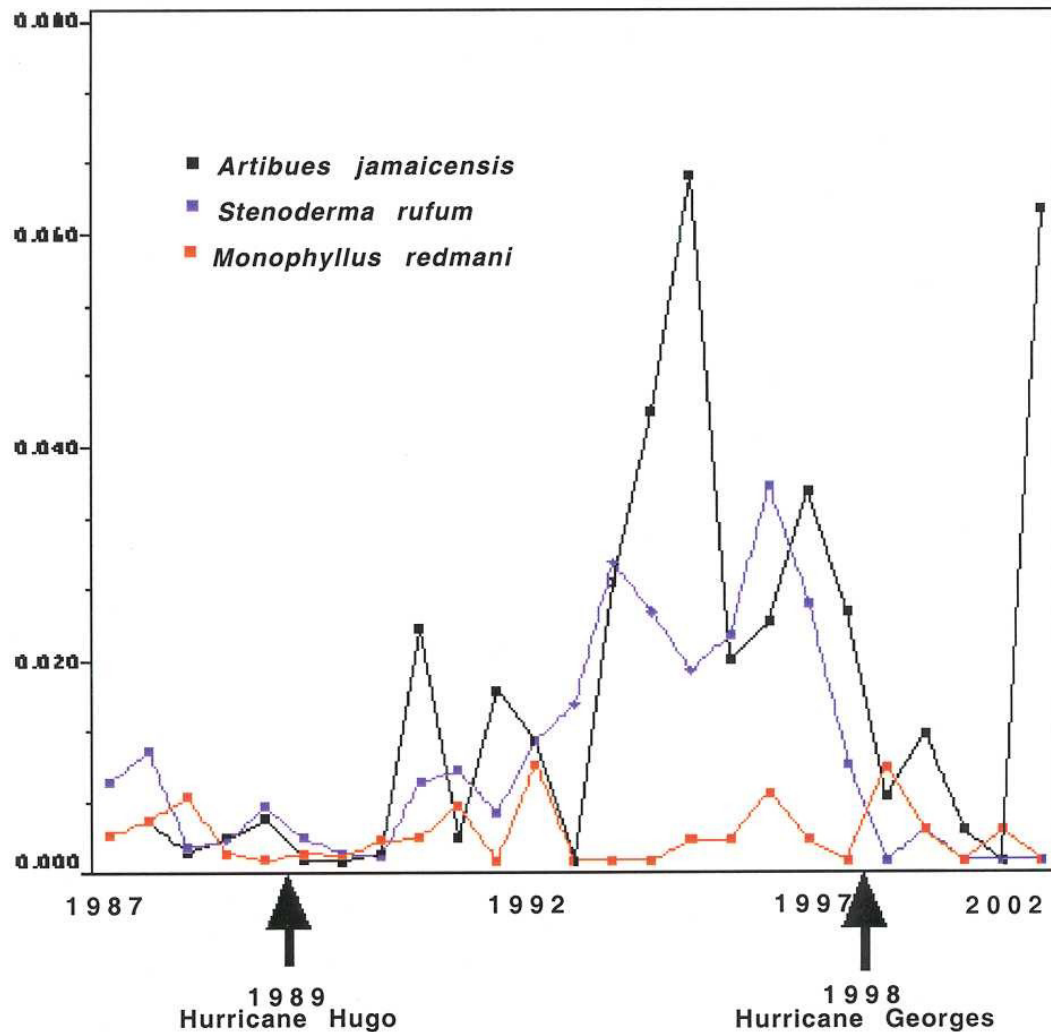


Fig. 2 – Graph of long term population monitoring data (bats captured per net hour vs. year) from the Luquillo Experimental Forest. Three dominant species are graphed, *Artibeus jamaicensis* (open black box), *Stenoderma rufum* (blue diamond) and *Monophyllus redmani* (Orange closed box). Years 1988 – 1995 were sampled twice, once in the rainy season (summer) and once in the dry season (winter). All other years were sampled only once during the rainy season.

## Integrated Pest Management

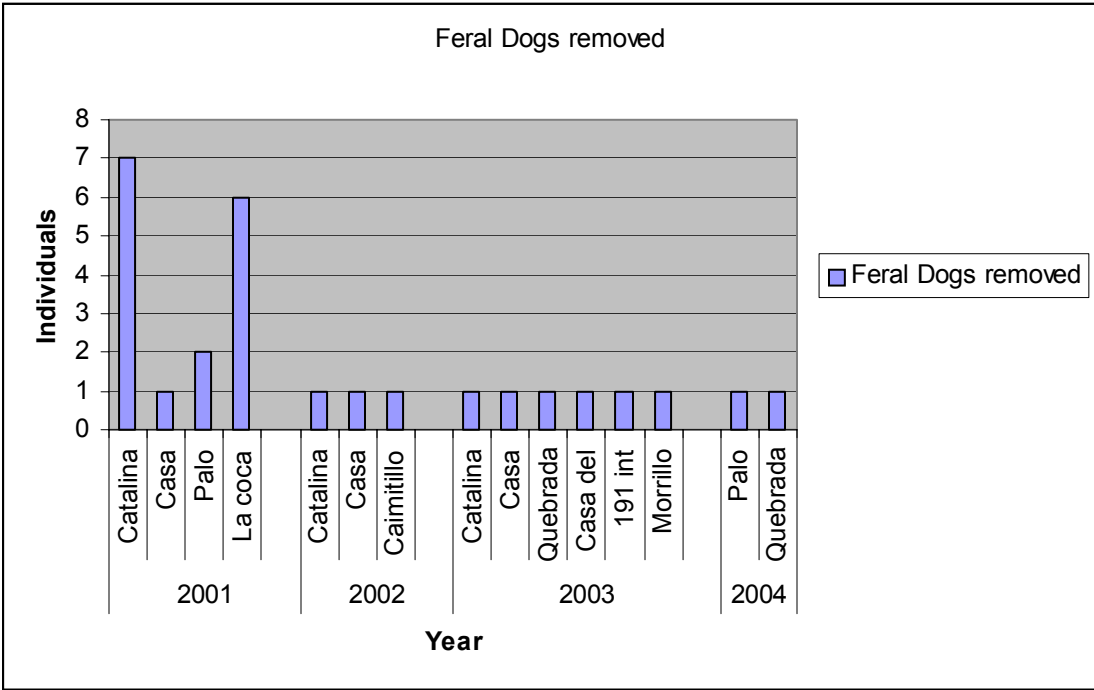
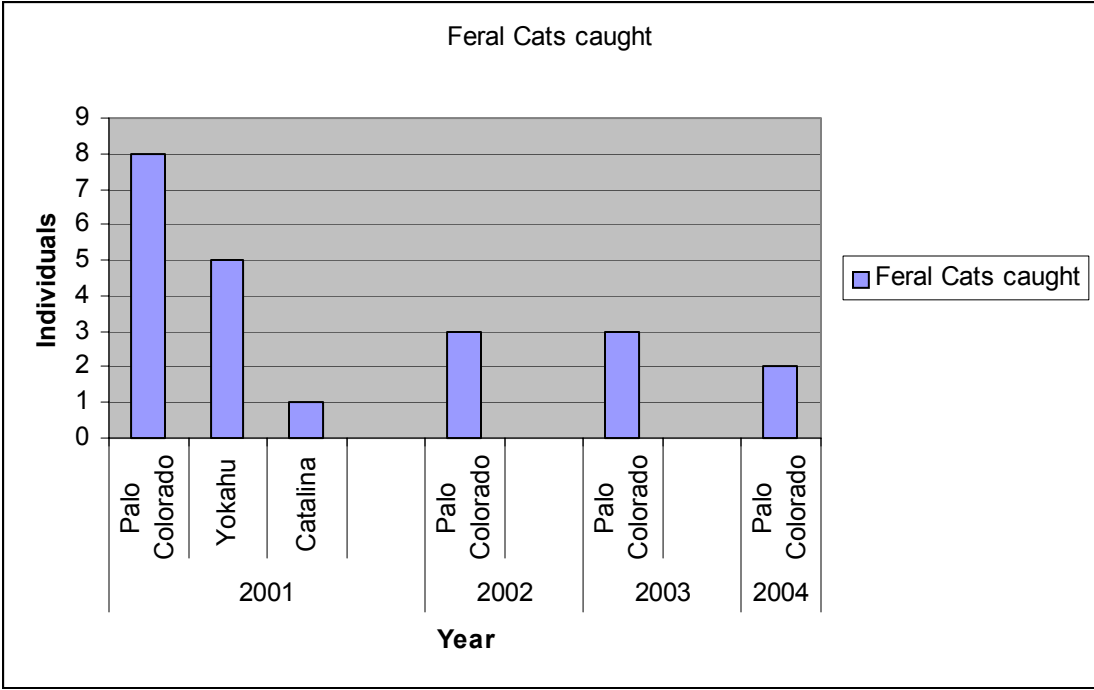
*Objective:* Identify forest pest problems through routine observations. Implement control in an integrated pest management approach.

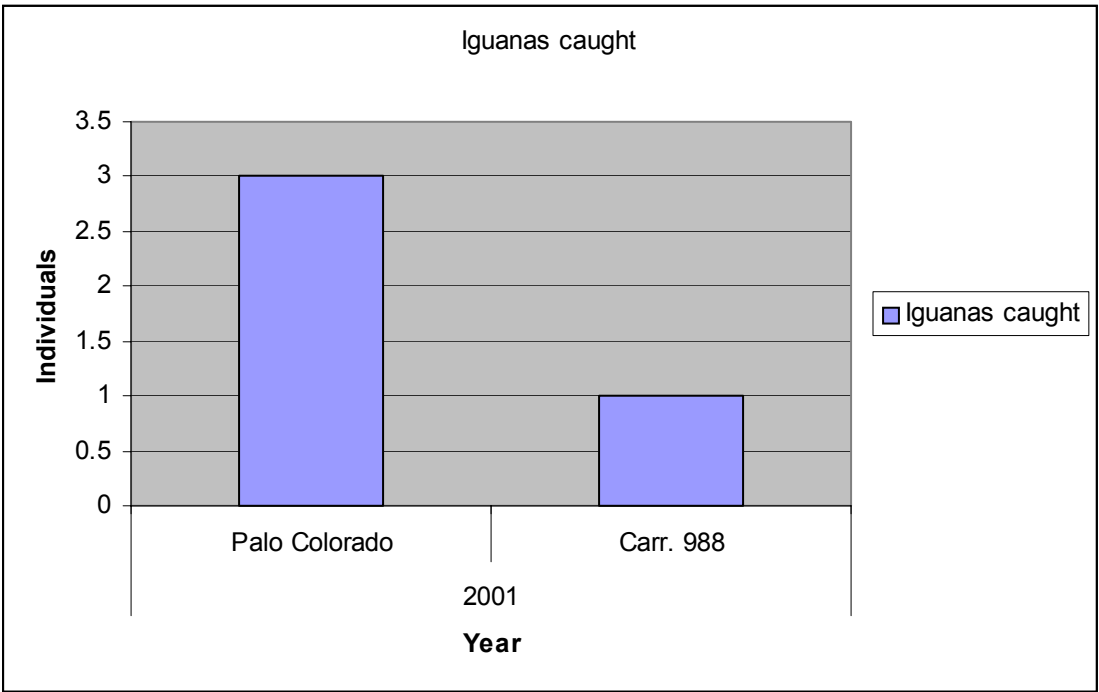
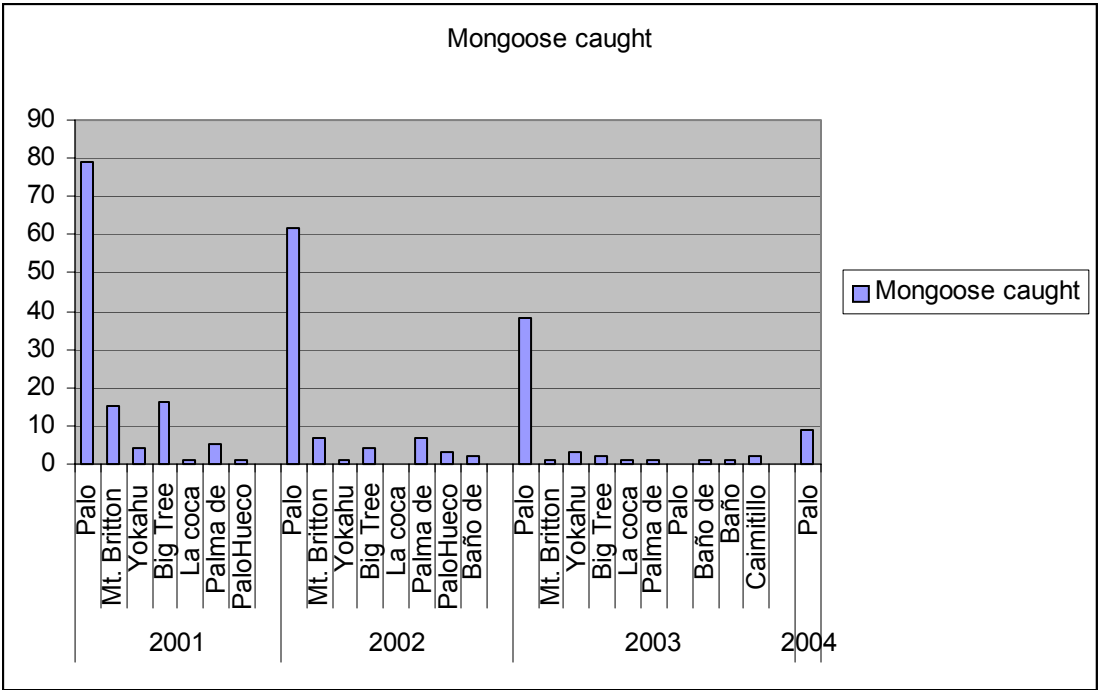
*Results:* The Forest has determined that the mongoose removal strategy will be applied, when “problem” animals—individuals that appear to have become habituated to seeking food from humans—are found in recreation areas.

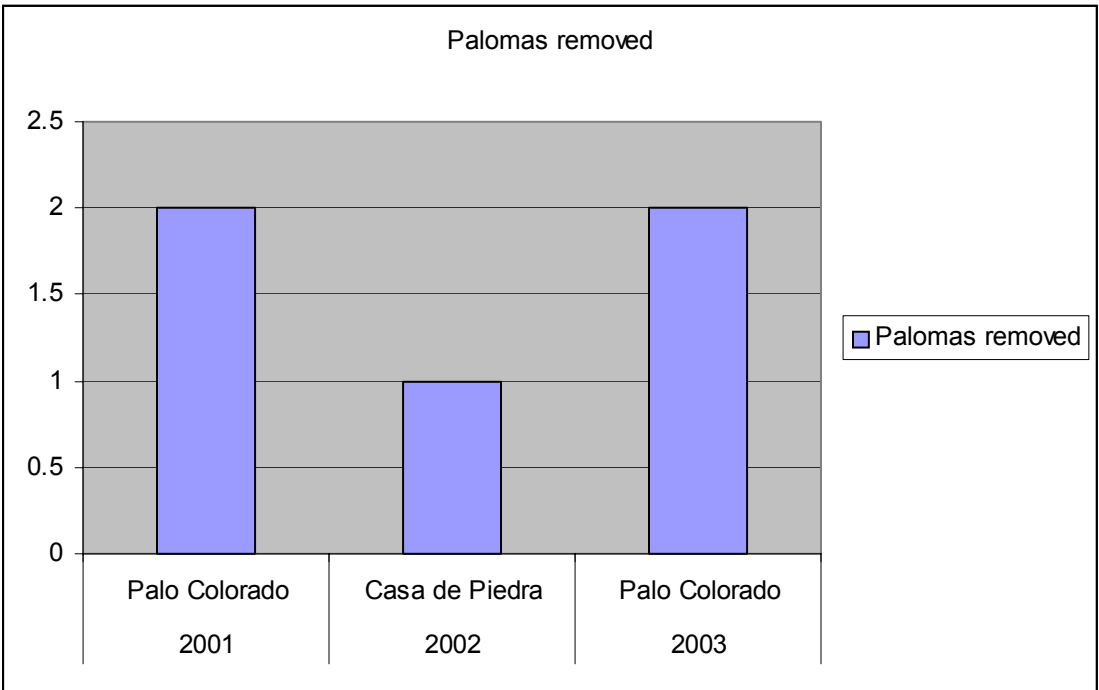
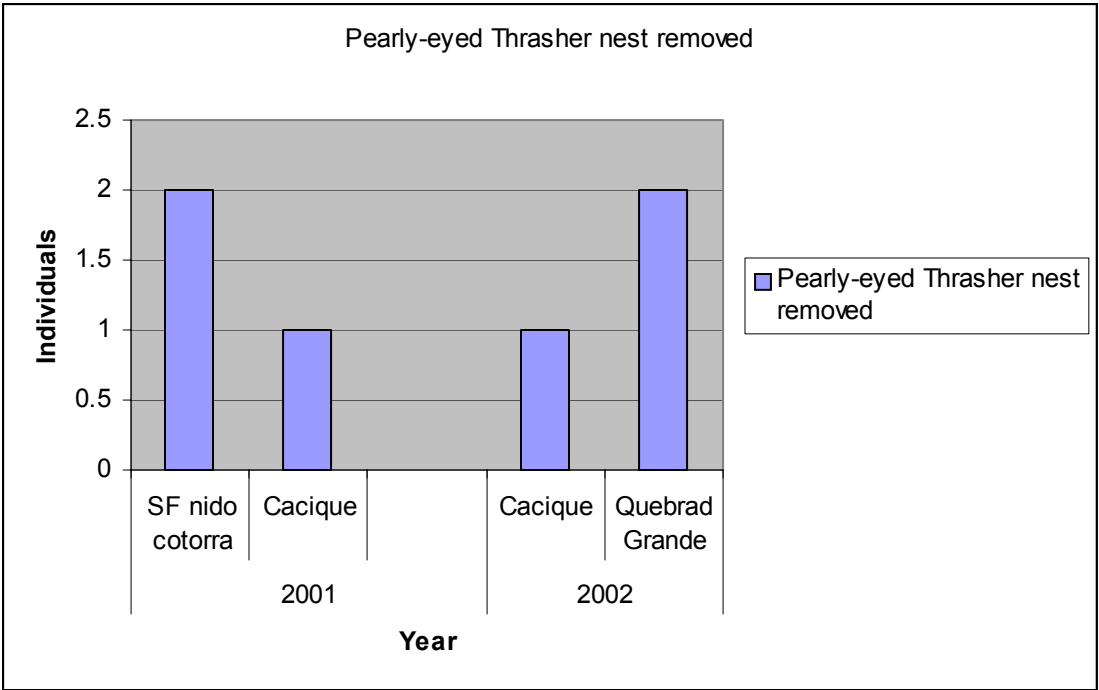
The honeybee is an introduced species, which can be undesirable in developed recreation areas and is a major problem for the Puerto Rican parrot recovery effort. The recent arrival in Puerto Rico of the more aggressive Africanized honeybee has made the problem more acute. 5 Bee traps baited with attractant pheromones are placed around parrot nests and in high human-use areas in order to intercept swarms. Monitoring of bee activity indicates that bee populations are highly variable from year to year. The most active year recently was 1994, with a dramatic decrease in 1995. Activity was low during 1998, but increased during in 1999 & 2000. Activity was moderate in 2001, 2002, and 2003 with honeybees removed from 2 parrot nests.

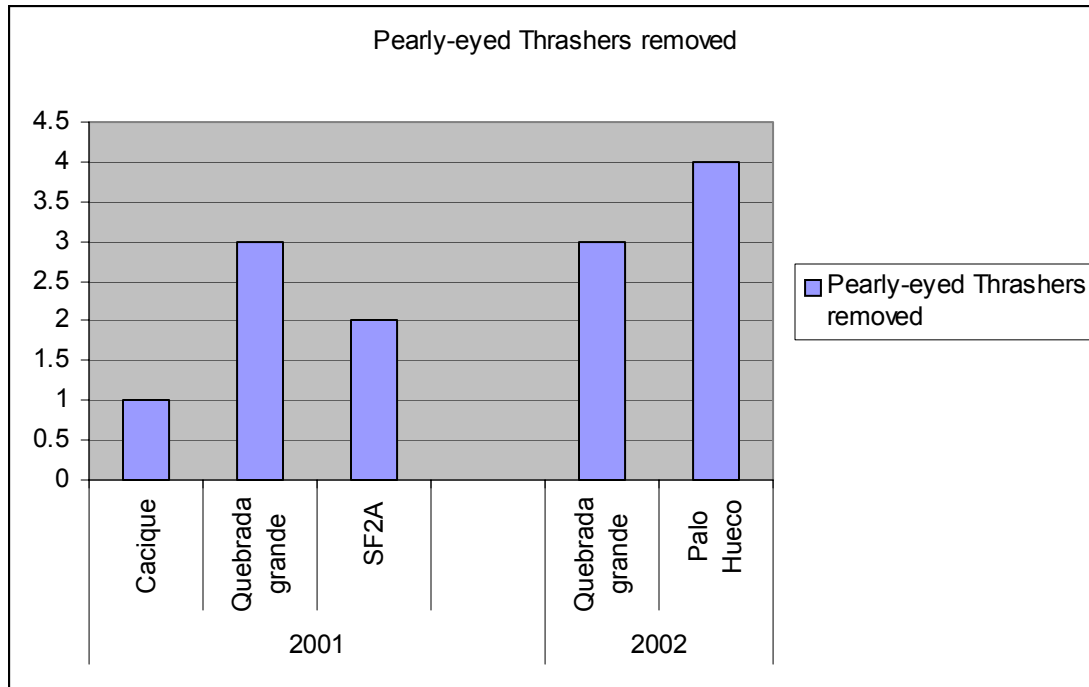
Other pest management activities related to parrot recovery included control of rats and pearly-eyed thrasher management. The thrasher is a competitor of the parrot, and a potential predator of parrot nestlings. Thrasher management strategy consists of providing them 2 nest boxes near parrot nests so that thrashers don't try to usurp the larger cavities the parrots need, while also establishing a territory around the nest they defend against other thrashers.

Many exotic animal species (in addition to honeybees and mongoose) have become established in Puerto Rico, posing varying degrees of threat to native species island-wide and within the Forest. For example the common iguana, *Iguana iguana*, of Central and South America, has become very common in coastal Puerto Rico. Populations appear to be stable within the Forest; during 2003, 2 individuals were identified as nuisance. Contrary to previous indications, it now appears that the iguana is capable of nesting within the Forest. Possible effects on native species remain unknown.









## Rare Plants

*Desired Condition:* Populations of proposed, endangered, threatened, and sensitive species (PETS) are stable or increasing.

*Measurements:* Surveys of known populations every two years during flowering and fruiting seasons. Conduct reconnaissance for new populations.

*Results:* **Ravenia urbanii** (Tortugo Prieto) and **Brunfelsia portorricensis** (both endemic and sensitive species) populations were detected in a proposed 1.5 acre project area. Fruits and seedlings were used in the mitigation efforts related to these two species. The Fideicomiso de Conservación de Puerto Rico (FCPR) assisted in the mitigation efforts, immediate results from this effort are:

➤ **Brunfelsia portorricensis:**

- 7 seedlings at El Portal nursery from seeds
- 75 seedlings in FCPR nursery at Rio Piedras from seeds
- 5 wildlings in FCPR from field collection

➤ **Ravenia urbanii:**

- 285 wildlings at El Portal nursery from field collection

*Desired Condition:* Recovery goals for proposed, endangered and threatened (PET) species are met.

*Measurements:* Surveys of known populations every two years during flowering and fruiting seasons. Conduct reconnaissance for new populations.

*Results:* Efforts in reproduction of PETS includes:

➤ *Pleodendrum macrantum:*

117 seedling at El Portal nursery from seeds.

40 seedlings in FCPR nursery at Rio Piedras from seeds.

➤ *Styrax portorricensis:*

14 seedlings; average height 2 feet at El Portal nursery

➤ *Eugenia haematocarpa:*

10 seedlings at El Portal nursery

➤ *Callicarpa ampla:*

2 wildlings from aerial layering, average height 2 feet, at El Portal nursery

## **Sustainable Forest Benefits**

### **Lands and Special Uses**

*Desired Condition:* Landlines around all National Forest system property are established to standard within the first planning years. Established landlines are maintained every 5 years.

*Measurement:* Miles of landlines established and maintained.

*Results:* Regular funding for landline maintenance continues to be very limited. One mile was maintained in FY2004.

Legal closing procedures were completed resulting in the acquisition of a 14-acre property in the El Verde area of the Forest. The deed was presented to the property registry in September, 2004.

Work continued on the transfer of a 9-acre property in the El Verde area from the US Marshals Service to the Caribbean National Forest. Discussions continued with the Puerto Rico Department of Transportation and Public Works on the acquisition and

donation of over 300 acres of land as mitigation for the construction of the Route 66, a major new transportation route between San Juan and the northeast side of the island.

*Desired Condition:* Special use permittees comply with all provisions of their permits.

*Measurement:* Special use permits compliance inspections.

*Results:* Long-term (more than one year) special use permits issued or administered in FY 2004 included:

- 40 outfitter-guides
- 1 organization camps
- 2 water diversions/pipelines
- 2 road rights-of-way
- 7 communication facility sites
- 1 electrical transmission line
- 4 recreation residences
- 23 research permits

Temporary permits of less than one year in 2004 included:

- 4 research permits
- 19 filming/commercial photography
- 13 non-commercial group events

Three permit amendments were issued in FY 2004 (2 for research and 1 for a commercial filming)

A special use permit was issued to the Federal Aviation Administration (FAA) for the operation of radar facilities at East Peak. Negotiations in FY2003-2004 between the Navy, FAA and the Forest Service resulted in the transfer of certain facilities from the Navy to the FAA. FAA conducted several site renovations at East Peak after the facility transfer. Work continues with the Navy for the removal of remaining facilities and equipment at the East Peak site.

In March, 2004 a food service concession, Yuquiyu Delights, was established under a Granger-Thye permit at the Palma de Sierra Recreation area. Under the permit, the holder operates a food service concession and provides maintenance to the area and the Forest Service also receives a percentage of revenues. Plans are to expand food service operations to the El Portal Tropical Forest Center in 2005.

The Institute of Tropical Ecosystem Studies (ITES), under a special use permit to administer research at the El Verde Field Station, began construction of a new dormitory facility at the site. After completing an environmental assessment and issuing a decision notice to proceed in August 2004, the ITES permit was amended to include a canopy trimming experiment to evaluate effects of predicted increased frequency and intensity of

hurricanes on the forest ecosystem. The proposed research will begin in FY2005 and will include the simulation of a hurricane in six plots through the trimming of certain branches and stems of certain trees within these plots and then monitoring the plots for dynamics related to ecosystem recovery.

Administrative efforts in FY2004 focused on getting backlog bills for special use rental fees into compliance.

## **Scenery Resource**

*Desired Condition:* Visual quality of communications sites improves from Maximum Modification toward Visual Quality Objective (VQO) Modification.

*Measurement:* Visual inspection to determine progress toward desired visual quality objective.

*Results:* No impacts suffered or improvements achieved to VQO during FY 2004.

## **Transportation System**

*Desired Condition:* The Forest's road system is maintained to standards to serve public demand for access, to meet management needs, and to protect resources in a cost-effective manner.

*Measurement:* Miles of road by maintenance standards. Annual inspection.

*Results:* Roadside maintenance on PRDOT jurisdiction roads continue to be below desired standards. Major effects are on inadequate sight distances and poor visual quality caused by high roadside vegetation.

A total of 11.3 miles of Forest Service Roads were inspected and 2 miles maintained to full standard.

On September 15, 2004, tropical storm Jeanne passed over the island of Puerto Rico. On September 16 a combined two-day total of 15.84 inches of rain were recorded officially at the USGS Mameyes River-NR Sabana, PR water gauge station. This event combined with saturated terrain caused by prior rains (accumulation of 1.05 inches on September 14, 2004) produced severe flooding in all of the Forest's rivers and multiple landslides and washouts on all main access routes under commonwealth jurisdiction. Most slides were small cut bank slumps blocking access and were removed by the Puerto Rico Department of Public Works (PRDPW) within one week after the event. One very large slide (5 Acres) occurred in the Rio Sabana Watershed across the closed segment of PR 191 about ½ km north of the Rio Sabana. Another significant slide (0.5 Acres) occurred across PR 9966 within ½ km west of the new Aviary Site. This slide was removed by the PRDPW within two weeks of the event to restore access but the side hill appears unstable and future slides are expected until permanent stabilization could be completed. Funding

for permanent stabilization was requested through the Federal Highway Administration Emergency Relief for Federally Owned Roads (ERFO) program for work to be performed in FY05.

Forest roads (11.3 miles) suffered minor wind damages in the form of defoliation and light vegetative debris; gravel washouts; small slumps; and clogging of drainage structures and ditches.

The Forest obtained the concurrence from the Puerto Rico Highway & Transit Authority (PRHTA) for them to prepare, award, and administer a contract for a Mass Transit Alternatives Study during FY05. This study is a follow up to the *Transportation and Access Study for the Caribbean National Forest* completed in FY02 and will analyze in detail all the possible alternatives to provide a Mass Transit System into the Forest. The result of this study will be a firm proposed action to undergo Environmental Analysis. The PRHTA also agreed to provide Federal Transit Authority funding under a reimbursable agreement for the Forest to perform the Environmental Analysis. The agreement will be completed during FY05 for work to take place in FY06.

## **Administrative Sites**

*Desired Condition:* Administrative sites are safe, esthetically pleasing and are universally accessible.

*Measurement:* Annual OSHA inspection.

*Results:* Safety inspections were performed on all occupied administrative sites. The Catalina Service Center site and all buildings were operated and maintained to Forest Service Safety and Health standards throughout the year.

## **Recreation**

*Desired Condition:* A wide range of recreation opportunities is provided. Heavily used undeveloped sites are developed. A variety of trail opportunities is provided with adequate safe parking in trailheads.

*Measurement:* Developed site capacity (persons at one time or "PAOT"). Miles of trail constructed, re-constructed, and maintained to Forest Service standards. Use levels (thousands of recreation visitor days or "MRVD").

*Results:* The developed sites capacity during FY 2004 was 1503 PAOT. The offered Forest capacity was 526,067 PAOT-Days of which 398,254 were managed to standard. Total visitation to the Forest during FY 2004 was 719,015 visitors.

The conditions at El Portal Rain Forest Center continued to be excellent with no accumulation of deferred maintenance as a result of ongoing preventive maintenance and

landscaping contracts.

Six miles of recreation trails were maintained to Forest Service Standards.

*Desired Condition:* Forest visitors enjoy safe and enriching environmental and recreational experiences.

*Measurement:* Evaluation of recreation use and facilities to determine if ROS objectives are met. Customer surveys.

*Results:* Visitation registered at El Portal during FY2004 was 214,063 people. This includes 106,417 customers brought to the Forest by outfitters that check in at El Portal but not necessarily enter El Portal. The Forest Visitor fees collected under the Recreation Fee Demo program were \$495,728. This is a slight increase (9.0%) from FY 2003 when \$454,858 was collected. Ninety five percent of the fees collected remain on site to be used for fee collection services, maintenance, and improvement of facilities and services.

The Forest Adventure Program, which was introduced in FY1999, and provides guided hikes by trained Forest Service interpreters continued in 2004 but continued to decrease from 6300 customers and revenues of \$21,300 in FY2002, to 4,550 customers and revenues of \$16,129 in FY 2003, to 3,400 customers and revenues of \$12,550 in FY2004.

## **Wilderness**

*Desired Condition:* Wilderness protects the largest remaining example of Puerto Rico's original forest. Primary forest, dwarf forest and rare plants and animals are protected. Opportunities for primitive recreation experiences and solitude are provided.

*Measurement:* Limits of acceptable change analysis. Customer survey.

*Results:* Wilderness values were not altered during 2004. Bill requesting congressional designation of 10,000 acres in Management area 5 (Wilderness) was introduced in house and senate.

## **Wild, Scenic, and Recreation Rivers**

*Desired Condition:* River segments eligible for Wild, Scenic, or Recreation (W/S/R) designation are managed to retain the attributes that qualify them for such designation.

*Measurement:* Proposed management practices are evaluated as part of project planning process. Visual confirmation that Visual Quality Objectives (VQO) of preservation is met for segments eligible for Wild and Scenic designations, and VQO of retention is met for segments eligible for Recreation designation.

*Results:* Three rivers within the boundaries of the Caribbean National Forest were designated as National Wild & Scenic Rivers in December 2002. The Rio Mameyes was

designated as a wild river for 2.1 miles, as scenic river for 1.4 miles, and as recreation river for 1.0 miles for a total of 4.5 miles. The Rio De La Mina was designated as a recreational river for 0.9 miles and as scenic river for 1.2 miles for a total of 2.1 miles. The Rio Icacos was designated a scenic river for 2.3 miles. River corridors retained the qualities that qualified them for designation.

## Research

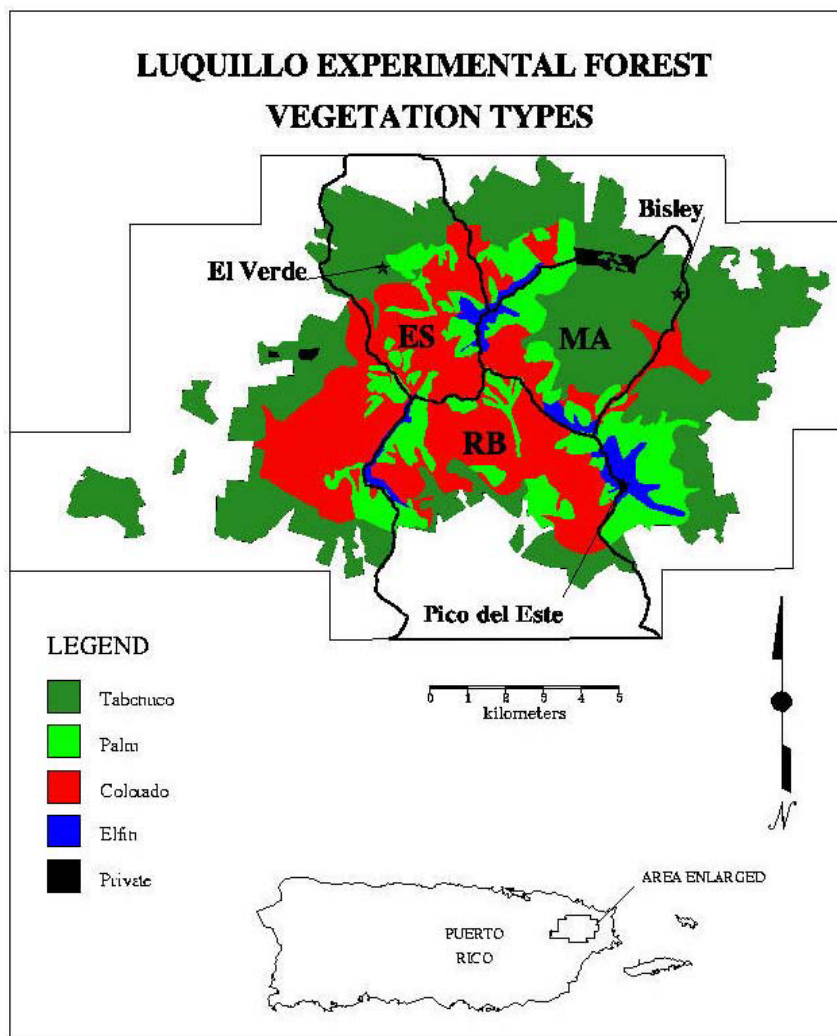
*Desired Condition:* Research conducted on the Forest continues to contribute to improve management. Completed studies do not preclude future studies in the same area.

*Measurement:* Assessment in annual IITF report.

*Results:* The 11,330-ha Luquillo Experimental Forest has several distinctions within the experimental forest network. It is the only tropical forest in the system and it is the only experimental forest with the same boundary as the National Forest, i.e., the Caribbean National Forest (CNF) and the LEF are one. The core area of the CNF was designated public land 1876 by the King of Spain. The CNF became a forest reserve in 1903, several years before the establishment of the National Forest System. In 1956, the CNF was designated an experimental forest. Research in this forest dates back over 100 years, being one of the most intensively studied tropical forests in the world. The forest was designated the Luquillo Biosphere Reserve in 1976, and a Long-Term Ecological Research site within the National Science Foundation program in 1988. The LEF harbors the largest area of primary forests in Puerto Rico--recently designated as wilderness by the US Congress,--and the most pristine rivers in the island, including several wild and scenic rivers.

**SOILS :** There are four soil associations representing 19 soil series in the LEF. The principal orders are Ultisols and Inceptisols, which respectively occupy 50 and 20 percent of the total forest area, and small areas with Inceptisols and other soil types. Dominant soils are deep, highly weathered and leached clays with low pH, and base saturation less than 35 percent at 1.25 m. Soil oxygen decreases with increasing elevation from 21 percent in aerated soils to anaerobic soils in cloud forests.

**VEGETATION TYPES :** The vegetation of the LEF (Fig. 1) is evergreen broadleaf tropical forest. The 240 tree species in the forest form different forest types with different species composition, structural development, and dominance with elevation. The cloud condensation level occurs above 600 m elevation, where soils are saturated, and forested wetlands constitute the forest cover. Increased elevation is associated with decreasing forest height, decreasing tree species diversity, increasing species dominance, increasing epiphyte abundance, and increasing tree density.



**Figure 1.** Vegetation of the Luquillo Experimental Forest combined into four forest types, described by dominant species or physiognomy. Lower elevations of the LEF (200-600 m) include tabonuco (*Dacryodes excelsa*) forest, which is studied intensively at El Verde Field Station and the Bisley Experimental Watersheds. Elfin forest occurs at the summits of the Luquillo Mountains over 900 m where conditions are extremely wet, cloudy, and windy; Pico del Este is a commonly used study site. At intermediate elevations, colorado (*Cyrilla racemiflora*) and palm (*Prestoea montana*) forest occur, with the latter occupying the steepest slopes and riparian areas. Efforts to document community variation in biotic communities are utilizing elevational transects in the Espíritu Santo (ES), Mameyes (MA) and Río Blanco (RB) watersheds.

**LONG-TERM DATA BASES :** Numerous databases are compiled at the LEF, including: maps of geology, soils, vegetation, disturbance history; seven sets of aerial photography since 1936; air temperature, precipitation since 1909; solar radiation, wind speed and direction, relative humidity; NADP precipitation since 1984; chemical composition of precipitation, dryfall, cloudwater, bulk soil, soil solution, throughfall, stemflow, streamwater, plant tissue, animal tissue, fungal tissue; vegetation composition, above- and below-ground biomass, tree growth/mortality, litterfall, litter decomposition, wood decomposition, mycorrhizal associations, phenology; population records and biomass of terrestrial and aquatic fauna. The long-term data records in Table 1 are available for the LEF, and many are available in the Luquillo LTER web page (<http://luq.lternet.edu>).

## **MAJOR RESEARCH ACCOMPLISHMENTS AND IMPACTS ON**

**MANAGEMENT:** Major research accomplishments were summarized in Lugo and Lowe (1995), including their application to forest management. Table 3 contains a listing of completed research products that are used continuously by land managers, conservation organizations, other professionals, and the public in general.

Table 3. Research Products that are essentially completed

1. Tree and vine identification
2. Parrot recovery techniques
3. Tree species selection for different sites
4. Reforestation techniques
5. Tree nursery techniques
6. Urban tree plantings
7. Silvicultural treatment for cutover and volunteer forests
8. Properties of Caribbean woods, drying and preservative treatments.
9. Rehabilitation of landslides
10. Wood production via plantations
11. Research techniques for long-term monitoring of
  - a. tree growth
  - b. tree turnover
  - c. wildlife abundance

## **Heritage Resources**

*Desired Condition:* All potentially significant heritage resources are protected.

*Measurement:* Inspection of projects during implementation, where surveys detected presence of potentially significant heritage resources. Inspection of known heritage sites every two years, where projects are not occurring.

*Results:* Six ongoing projects were inspected and monitored for potential impacts to heritage resources. No heritage sites were adversely impacted by management activities during FY 2004. No undertaking resulted in the discovery of unanticipated archaeological property. Over 20 significant heritage sites were monitored, including visits to prehistoric petroglyph sites and historic structures.

The NEPA process was initiated for input on the Heritage component of the proposed new Puerto Rican Parrot Aviary. A five (5) acre area was intensively surveyed and shovel tested; as a result, two properties dating to the Civilian Conservation Corps (CCC) era were determined eligible for the National Register of Historic Places; they are the Mameyes-Rio Blanco PR 191 Road and the Trail 37 on Zarzal Ridge. A Stage IA-IB cultural resources report was prepared, and a Memorandum of Understanding, including a Stage III Mitigation Plan, was entered in to with the Puerto Rico State Historic Preservation Office (PRSHPO) to mitigate adverse impacts to these two significant historic properties.

As part of the NEPA process for a proposed Special Uses project within the El Verde Research Station, surveying and testing for heritage resources was conducted on the 1.3 acre area of potential impact. No heritage resources were discovered during this process; a report was prepared and submitted to the PRSHPO.

An additional 1.5 acres was intensively investigated in order to document and map the ruins of the Sabana CCC work camp, and an adjacent 15 acres were surface surveyed. This resulted in the discovery of a historic petroglyph carved into a boulder along the Sabana River, bordering the camp. The glyphs are apparently initials of several people, quite possibly of CCC enrollees. Lastly, two historic residence sites near Puente Roto were documented within the 144 acres in the recently acquired El Conde Tract.

CNF is lending support to the Puerto Rico Army National Guard by conducting an archaeological properties survey of the Camp Santiago Training Site in Salinas; as well as providing archaeological expertise to USDA Natural Resources Conservation Service and the Puerto Rico Highway Department.

## **Law Enforcement**

*Objectives:* The objective of the Caribbean NF, Law Enforcement and Investigations Division personnel is to ensure the public and employee safety while providing protection of Forest Resources, Cultural Resources, Wildlife and Property. Communication between Law Enforcement, the public and all other FS employees is vital for the LE program to meet its objectives.

*Results:* The unit assisted in the arrest of individuals for different criminal acts. Around 286 Warnings, 241 Incidents, and 723 Violation Notices were issued, investigated, and reported in the Law Enforcement and Investigations Managements Attainment Reporting System during FY 2004. Also, assistance has been offered to other federal and State agencies such as the US Fish and Wildlife Service, National Park Service, Puerto Rico Police Department, Rio Grande Municipal Police and the Natural Resources Rangers Corps, in providing them with criminal computer information. Also, citations for simple marijuana possession and discharging a firearm were issued during this period. One fugitive from a juvenile detention facility was arrested and a series of Search and Rescue incidents were conducted. Assistance to local authorities was offered on the finding of a dead body. Assistance with Criminal Background Checks was also offered.

## **Fire and Other Emergencies**

*Objective:* The Plan has no objectives for fire. Evidence indicates that fire was not a natural part of the Forest's ecology, although limited areas of the Forest with non-native vegetation can occasionally support limited fire activity during periods of drought. The forest is tasked to support major fire suppression efforts and other emergency responses on mainland forests.

*Results:* No fires occurred on the Forest in FY 2004. The forest did not dispatch crews to fires in 2004. Work Capacity Tests and Annual Refresher training was completed. One additional Crew Boss was certified giving us a total of 4 available. *Incident Qualification and Certifications System* (IQCS) was implemented on the Forest in place of Red Card, which is being phased out nationally. The Forest leads the Multi Agency Coordination Group. The group is comprised of federal land management agencies with interest in risk management. The forest dispatched one overhead resource to the Southern Area Coordination Center (SACC) early in the fire season, and also dispatched one overhead resource to the Florida Interagency Coordination Center (FICC) for hurricane relief at the end of the fiscal year.

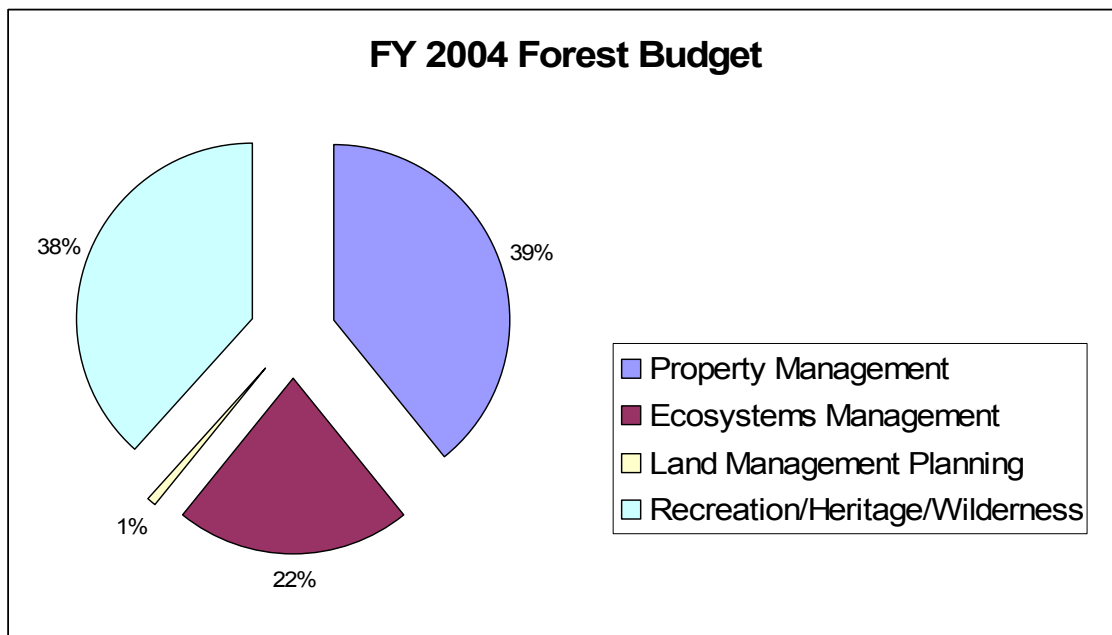
## Business Operations

The Forest worked with an approximate of 4.7 million dollars during fiscal year 2004. This amount includes \$ 412,000 for the Senior Community Service Program, \$ 405,000 in fee collection for recreation areas, and \$ 662,000 from Cooperative Work and services provided to Federal Agencies through agreements. The highest Congressional allocation of \$1,257,000 was received for Recreation, Heritage and Wilderness Management. The lowest Congressional Allocation of \$ 3,600 was received for Quarters Maintenance. We received an additional \$ 305,000 for storm damage restoration and repairs. We collected \$ 20,000 in donations.

**Following is a Table with Forest Program totals:**

<b>Forest Programs</b>	<b>FY 2004 Budget (\$)</b>
Land Management Planning	21,000
Landownership Management	56,000
Recreation/Heritage/Wilderness	1,257,000
Site Specific Special Fund	405,000
Facility Capital Improvement & Maintenance	605,000
Roads Capital Improvement & Maintenance	113,000
Trails Capital Improvement & Maintenance	75,000
Land Acquisition	28,000
Quarters Maintenance	3,600
Wildlife Management	335,000

Vegetation & Watershed Management	139,000
Inventory and Monitoring	182,000
Forest Fire Management	50,000
Forest Health Funds	5,000
Law Enforcement	0
<b>Total Appropriations</b>	<b>3,274,600</b>
<b>Additional Funds</b>	
Storm Damage Work	305,000
Cooperative Work	10,000
External Reimbursable	662,000
Senior Community Service Employment Program	412,020
<b>Total Funds for FY03</b>	<b>4,663,620</b>



## **Personnel**

Permanent Employees .....	35
Temporary Employees .....	8
Senior Community Service Employees (SCSEP) .....	73
Volunteers .....	480
Youth Conservation Corps (YCC).....	7

## **Youth Conservation Corps (YCC)**

The Youth Conservation Corps (YCC) provides employment for 15 to 18 year-old youths to help them develop an understanding and appreciation of Forest Health and Management. Seven young adults participated in the YCC program during fiscal year 2004. Three young women and four young men, there was four males, because one of them did not complete the full term and the alternate was called to complete the term.

This year for the first time the participants were hosted by the Recreation unit. Their daily duties involved the picking up of garbage and trail maintenance. They had the opportunity to work together with another YCC program hosted by the Dept. of Interior, Park Service. Our enrollees went and worked with them for a day and they came to the Forest and worked with us at the Forest.

Their value was appraised at 17,331 dollars and 1,835 accumulated hours rendered.

## **Senior Community Service Employees (SCSEP)**

The Senior Community Service Employees Program provides part-time enrollment for work experience and job training opportunities for elderly low-income individuals. Our seniors are one of the Forest's most valued human resources. Their many contributions include providing information and interpretation to Forest visitors, recreation site and trail maintenance and construction, and clerical support.

They are productive and reliable individuals that enjoy the great outdoors and want to continue to work.

This year's value of seniors work was appraised at 595,097 dollars and provided 60,232 hours of labor.

## **Volunteers**

In 2004 volunteers contributed labor with an estimated value of 78,116 dollars. Four hundred and eighty volunteers assisted with trash removal, interpretive programs, trail maintenance, wildlife habitat improvement and monitoring, and clerical support. They divided as follows: 136 males and 98 females under 18 years of age; 131 males and 100 females between 18-54 years old; and 8 males and 7 females over 55 years old. They

accomplished \$78,116 appraised dollar value and 7,735.7 accumulated hours.

The annual Clean-up Day is one activity that the community as well as the agency looks forward to. It is rewarding to participate with a diversity of age groups and the incredibly amount of enthusiasm, energy and sense of accomplishment demonstrated during this volunteering one-day activity.

For more information on volunteering, contact Elizabeth Trevino at (787) 888-5667 at the Catalina Service Center office.

## **Monitoring and Evaluation Interdisciplinary Team**

<b>M&amp;E Team Member</b>	<b>M&amp;E Data Analyzed</b>	<b>Position</b>
Carolyn Pabon	M&E report coordinator and editor, Forest Planner, Research Program liaison, Business Operations (Budget and Finance, Human Resources, Support Services, and Information Systems), and Labor Management.	Forest Planner and Administrative Team Leader
Manuel Ortiz	Recreation, Land and Special Uses, Wilderness, Wild & Scenic Rivers, Primary Forest, Scenery Resource, and Infrastructure.	Customer Service and Property Management Team Leader
Pedro Rios	Watershed, Wildlife and Fish, Rare Plants, Pest Management, Heritage Resources, and Emergency Response.	Ecosystem Management Team Leader
Jose Ayala	Law Enforcement	Patrol Captain

## **FY 2004 Action Plan**

A Forest Priority Plan is developed every year by the Forest Leadership Team (FLT). The FLT consists of the Forest Supervisor, the Planning and Administrative TL, the Ecosystem TL, the Customer Service and Property TL, the Patrol Captain, and the Forest Supervisor's secretary. The Administrative TL coordinated the Forest Priority meeting, and gathered, compiled, and edited the final document. The objective of the FY04 Forest Priority Plan is to lead Forest employees throughout the year within the context of National, Regional and Local Resource and Forest Management emphasis areas, including the Chief's Four Threats. The FY 2004 Forest Priorities was developed and recommended by the Forest Leadership team, and approved by the Forest Supervisor.

## **Actions completed in 2004**

1. Wellness Program Development.
2. Agency's Information Systems Competitive Sourcing.
3. Financial Management (FM) Business Process Reengineering (BPR) including the Financial Management Improvement Project (FMIP).
4. Annual reporting (WorkPlans, PAR, M&E report, other).
5. 2003 storm damages repairs.
6. Award and administer Customer Service/Property contracts.
7. OWCP, Civil Rights, SCSEP, Volunteer, and YCC program management.
8. Parrot habitat improvements.
9. Exotic Species FONSI and DN.
10. Environmental Education and Interpretive Program management.
11. Emergency Plan.
12. Infrastructure management (roads and facilities).
13. Mass Transportation development.
14. National Guard Agreement Management.
15. Rio Sabana Picnic Area contract award.
16. Aviary EA and design package completion.
17. External Relations with local government and agencies.

## **Proposed FY 2006 Action Plan**

1. Maintain local E-Gov current and translate in Spanish.
2. Human Resource (HR) Business Process Reengineering (BPR).
3. Indirect cost pools analysis for FY06-FY08 and staff re-alignment.

4. Forest Safety Program Implementation.
5. Annual reports (M&E, PAR, WorkPlans, other).
6. SCSEP replacement strategies.
7. Legislative Affairs.
8. Land Use surrounding the Caribbean NF.
9. Gateway Communities.
10. Community relations.
11. Research Symposium.
12. Exotic Species Management.
13. Emergency Plan.
14. Endangered Species Management.
15. Watershed Restoration.
16. Camp Santiago/National Guard Agreement Management.
17. Timber Demo analysis.
18. Mass Transit System.
19. Aviary and Sabana Picnic Area construction.
20. Infrastructure management.
21. Comprehensive River Management Plan.
22. Recreation strategy, Marketing Plan, and El Portal improvements.
23. Special Uses/Lands Program Management.
24. Law Enforcement.